National Cancer Research Institute
Cancer Conference

Abstracts from the NCRI Cancer Conference

Back

Circulating Tumour Cell Analysis to Evaluate Docetaxel Treatment Response and Resistance Markers in Prostate Cancer

Year: 2021

Session type: E-poster/poster

Caitlin Davies[1]

[1]Barts Cancer Institute

Abstract

Background

Docetaxel (DOC) treatment has been shown to significantly improve overall survival (OS) in metastatic castration-resistant prostate cancer (mCRPC), and recently is used as chemo-hormonal therapy in metastatic hormone-sensitive prostate cancer (mHSPC). However, a proportion of patients treated with DOC have inherent/acquired resistance. This project investigates circulating tumour cells (CTCs) in blood liquid biopsies as a novel tool for predicting and/or monitoring DOC response.

Method

Longitudinal CTC sampling was performed using the Parsortix system in 44 mHSPC and 12 mCRPC patients. A total of 205 CTC samples were analysed for changes in CTC number, phenotype and mRNA expression.

Results

CTCs were detected in 34/56 patients. 75% of patients with progressive disease (PD) had a positive CTC score pre-DOC, compared to 44% of patient with a partial response. Spearman's analysis of pre-DOC CTCs revealed a significant inverse correlation of CTC parameters with OS and progression-free survival (PFS). CTC positive score and Cytokeratin(CK)+CTCs had the most significant correlation with OS. CTC score was significantly correlated with OS in mCRPC patients (ρ =-0.8528, p=0.0095). High total CTC number significantly correlated with OS in mCRPC (ρ=-0.6986, p=0.0311), while the number of CK+CTCs were significantly correlated with OS in mHSPC+mCRPC combined (ρ=-0.4592, p=0.0013) and mCRPC (ρ=-0.8636, p=0.0024). Kaplan-Meier analysis of CTCs before DOC revealed both positive CTC score and the presence of ≥ 1 CK+CTC before DOC significantly predicted poor OS in combined mHSPC+mCRPC cohorts (p=0.0117), as well as OS (p=0.0018) and PFS (p=0.0240) in mCRPC alone, while ≥5 CTC best predicted poor OS (p=0.0194)in mHSPC. Fluidigm multiplex-qPCR analysis of a custom designed 32 gene panel of CTC mRNA revealed that patients with PD, poor PFS and OS had high expression of KLK2 at each blood collection time point, and was significantly more predictive than KLK3 (PSA).

Conclusion

These findings provide a promising potential solution to predicting and monitoring DOC resistance using a non-invasive and easily repeatable system.

Impact statement

Liquid biopsies offer a non-invasive and easily repeatble method of anaylsing cancers, allowing for routine lonitudinal moriting of patients and early theraputic intervension.

Back